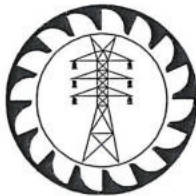


017-1:2019

CEB
SPECIFICATION

GAS INSULATED RING MAIN UNIT



CEYLON ELECTRICITY BOARD
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SPECIFICATION FOR GAS INSULATED RING MAIN UNIT

1.0 SCOPE

This Specification covers the general requirements of the design, manufacture, testing, supply and delivery of following types of outdoor, Gas Insulated (SF₆), Ring Main Unit (RMU) for 11kV and 33kV UG distribution networks in Ceylon Electricity Board, Sri Lanka.

- (a) Non-extensible Ring Main Unit 11kV / 33kV, with/without remote operation facility.
- (b) Circuit breaker module for tee-off for extensible RMU 11kV / 33kV, with/without remote operation facility.
- (c) Ring Switch extension for extensible RMU 11kV / 33kV, with/without remote operation facility.
- (d) Circuit breaker module for tee-off for extensible RMU 11kV / 33kV, with/without remote operation, with energy metering facility.

The procurement entity shall prescribe above categories in price schedule indicating the relevant quantities.

2.0 SYSTEM PARAMETERS

(a)	Nominal voltage (U)	11 kV	33 kV
(b)	System highest voltage (U _m)	12 kV	36 kV
(c)	System frequency	50 Hz	50 Hz
(d)	Method of earthing	Resistive Earthed	Effectively Earthed
(e)	System fault level/duration	20 kA / 1 second	20 kA/ 1 second



3.0 SERVICE CONDITIONS

(a)	Annual average ambient temperature	30 °C
(b)	Maximum ambient temperature	40 °C
(c)	Maximum relative humidity	90%
(d)	Environmental conditions	Humid tropical climate with heavily polluted atmosphere
(e)	Operational altitude	From M.S.L. to 1900 m above M.S.L.
(f)	Isokeraunic (Thunder days) level	100 days

4.0 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	IEC 62271-1:2017	High-voltage switchgear and controlgear - Part 1: Common specifications for alternating current switchgear and controlgear.
(b)	IEC 62271-200:2011	High-voltage switchgear and controlgear - Part 200: AC metal-enclosed switchgear and controlgear for rated voltages above 1 kV and up to and including 52 kV.
(c)	IEC 62271-100:2008	High-voltage switchgear and controlgear - Part 100:

		Alternating-current circuit-breakers.
(d)	IEC 62271-102:2018	High-voltage switchgear and controlgear - Part 102: Alternating current disconnectors and earthing switches.
(e)	IEC 62271-103:2011	High-voltage switchgear and controlgear - Part 103: Switches for rated voltages above 1 kV up to and including 52 kV
(f)	IEC 60376 : 2018	Specification of technical grade sulphur hexafluoride (SF6) and complementary gases to be used in its mixtures for use in electrical equipment.
(g)	IEC 61869-1:2007	Instrument transformers - Part 1: General requirement
(h)	IEC 61869-2:2012	Instrument transformers - Part 2: Additional requirements for current transformers.
(i)	IEC 60529:1989	Degree of Protection provided by enclosures(IP Code).

Material conforming to other International Standards which are equal to or higher but not less stringent than the Standards stipulated above may be offered. When such alternative Standards are used, reference to such Standards shall be quoted and English language copies of such Standards shall be provided with the offer.

However in the event of discrepancy, details given in this CEB specification supersede above standards.

5.0 BASIC FEATURES

5.1. Minimum Technical Requirements

	Description	Unit	12 kV RMU	36 kV RMU
a.	Rated Values			
	Rated Lightning Impulse withstand Voltage	kV	75 (common value) 85(across isolating)	170 (common value) 195 (across isolating)
	Rated short-time withstand current/duration	kA-sec	20 -1Sec.	20-1Sec.
	Rated peak withstand current	kA	50	50
	Rated Power Frequency withstand Voltage	kV	28	70
b.	Ring Switches			
	Rated normal Current	A	630	400
	Rated breaking current	A	630	400
	Rated short-circuit making current	kA	50	50
	Classification for mechanical endurance		Class M0 (or higher)	
	Classification for Electrical endurance		Class E2	
	Earthing Switch-short circuit making current	kA	50	50
	Earthing Switch-Classification of mechanical endurance		Class M0(or higher)	



c.	Tee off			
	Tee off Vacuum Circuit Breaker			
	Rated normal current	A	200	100
	Rated short circuit breaking current	kA	20	20
	Rated short circuit making current	kA	50	50
	Rated operating sequence		O – 3min – CO – 3min – CO	
	Classification for mechanical endurance		Class M1 (or higher)	
	Classification for Electrical endurance		Class E2	
	Tee-off Earthing switch			
	Classification for mechanical endurance -Disconnecter		Class M0 (or higher)	
	Classification for mechanical endurance –Earthing switch		Class M0(or higher)	
	Operating mechanism type		Manual Independent Spring Charge	
e.	Internal Arc Rating	kA	20- 1Sec (Accessibilty Type B)	
f.	Insulating Gas		SF ₆	
g.	Minimum Operating Pressure		Near 1 atmospheric pressure	
i.	Degree of protection		IP 54 except for SF ₆ gas tight tanks	

5.2. Design Criteria

5.2.1. Introduction

The equipment shall meet the criteria for compact, metal enclosed outdoor switchgear in accordance with IEC 60298.

The Gas (SF₆) insulated Ring Main Unit shall be out door type & designed to operate at the applicable highest system voltage. All live parts shall be sealed from the environment for life with SF₆ gas or otherwise.

Gas-tight tanks shall be stainless steel or galvanized powder coated/painted steel gas-tight (not less than 2mm thickness), based on the design requirements of pressurized enclosures.

Outside surface of RMU shall be designed and treated for corrosive environment C5 category as per ISO/EN 12944-2 .The surface shall be thorough cleaned and shall be treated with hot zinc dip/spray of minimum 50 micron thickness. Then it shall be painted with a etch primer minimum thickness of 50 micron and minimum thickness of 100 micron undercoating. Then it shall be painted with a gloss or semi-gloss paint of minimum 50 micron thickness. The ultimate dry film thickness (DFT) shall not be less than 300 microns. (ISO/EN 12944-2).

Every precautionary method shall be taken to design and construct the unit is fully weatherproof against the service conditions indicated.

5.2.2. Basic Constructional Aspects

The All RMU switches & circuit breaker shall be in SF₆ gas-tight tank/s. Gaskets and joint designs shall remain gas tight under all normal service conditions. SF₆ shall comply with the requirements of BS EN 60376.

- Provision to prevent explosion during internal arc fault shall be provided. Features to



ensure the safe release of internal over pressure exceeding the safe design pressure shall be provided. Tanks exposed to the decomposition products of SF₆ gas shall be fitted with appropriate filters sufficient for the life of the equipment.

- Gas fill valve shall be provided for topping up of the SF₆ gas.

Operation of RMU shall be fully rated even at atmospheric pressure (zero gas pressure).

The outer protective steelwork shall be finished in such a way as to maintain the unit in a fully protected condition.

The Ring Main Units shall be of free standing & suitable for mounting on a trench or base for coupling transformer through cable connection. The floor fixing of the equipment shall allow for mounting on a simple plinth with a flat surface.

The unit shall be provided with lifting facilities of proven design for easy handling.

The equipment shall be complete with necessary cable termination boxes.

5.2.3. Non- Extensible Type RMU

The ring main unit shall consist of the following configuration as specified in the tender documents:

- Two (2) ring switches (with/without remote operation facility) for through feed and one (1) circuit breaker for tee-off according to manufacturer's type-tested configuration.

5.2.4. Extensible Type RMU

The extensible ring main unit shall consist of number of modules which can be extended on either side. The modules shall be as follows:

One (1) Circuit breaker module for tee-off extension for extensible RMU, with/without remote operation facility.

One (1) Ring Switch extension for extensible RMU, with/without remote operation facility

One (1) Circuit breaker module for tee-off for extensible RMU, with/without remote operation, with energy metering facility.

All couplings also shall be sealed from the environment for life.

5.2.5. Cable Boxes

The Cable boxes shall be suitable to receive three core XLPE/SWA UG cables sizes from 95 mm² to 240mm² on Ring switches & single core/ three core XLPE/SWA UG cables sizes up to 70mm² on 'T' off side.

Cable boxes shall be incorporated with cable glands and suitable for heat shrink type terminations.



5.2.6. Operating Mechanism

In case of remote operation:

- a) Both Ring Switches and T-offs should be motorized.
- b) Spring charging is generally done with AC power source, which will be converted to 24V DC power and in the absence of AC power, automatic selection of DC power source (from CEB supplied battery bank) shall be switched.
- c) Recharging of closing spring shall occur automatically as soon as the closing spring is released. Stored energy in the spring shall be sufficient for one C-O operation.

Otherwise:

- a) Both Ring Switches and T-offs are operated manually.
- b) The operating mechanisms shall be manual independent spring charged type ensuring the speed of operation is independent of the operator.

5.2.6.1. Ring Switches;

The Ring Switches shall be of fault make and load break type, having bank of three positions (Viz "On" , "Off" and "Circuit Earth" On/Off) ("Service", "Isolated", "Earthed").

The mechanism on the operation shall prevent any attempts to re-open immediately after closing of the ring switch or earthing switch.

Pre-wiring is required for motor connection points, auxiliary switches for position indication of Ring switch, CB, all earth switches and pressure transducer for low gas pressure alarm.

Motor for Ring Switch actuator mechanism shall be 24V DC linear Motor.

Manual operation shall be possible without any modification/removal even after motorizing the Ring Switch.

The closing operation shall be controlled by a manual independent spring operated mechanism ensuring the switch is operated at the correct speed. The 'On' to 'Off' sequence shall be achieved either by manual or through remote operation as selected.

5.2.6.2. Circuit breaker module for tee-off ;

Circuit Breaker shall be Vacuum type in the common gas insulated tank and Protection shall be incorporated with Relays. Overcurrent & Earth Fault as per the standard IEC curves and instantaneous trip settings shall be available in Relays. Suitable test block shall be provided to perform secondary injection testing.

Relay protection with remote trip & fault trip facilities shall be provided for the transformer protection from 250kVA up to 2000kVA. All necessary sensors should be provided.

The Circuit Breaker Switch shall be of fault make & break type, having bank of three positions "Service" , "Isolate" and "Earthed".

The closing operation shall be controlled by a manual independent spring operated mechanism ensuring the switch is operated at the correct speed. The 'On' to 'Off' sequence shall be achieved either by manual or through remote operation as selected.



5.2.7. Earth Fault Indicators

- (i) The earth fault indicator(EFI) which shall directly be operated by the secondary current from a split- core type core-balance transformer. EFI shall be an automatic resetting type after re-energizing the power supply. EFI shall reset by single phase 230V ac supply. The indicator shall be mounted outside the housing to IP54 degree of protection, so it is clearly visible when the main door is closed.
- (ii) Current Sensor (approx. 60/1 CT) shall be suitable to fix up to 95mm²/3C- 240mm²/3C cable and material shall be insulated silicon steel with releasable cable –ties for mounting. Lead cable shall be of 3m length(min), 2-core,0.5mm²,double insulated cable.
- (iii) The pick-up value of the EFI shall not be less than 25 Amp primary Current and the drop out value shall be more than 40 Amp of Primary Current.
- (iv) One Earth Fault Indicating device shall be provided to left side of the RMU incoming cable and shall be able to send indication signals to SCADA system.

5.2.8. Operational Positions & Indicators

All operational instructions, single line mimic diagram, position indicator of Ring switch On/Off & Earth on/off, position indicator of Circuit Breaker On/Off & 'T' off earth on/off shall be clearly marked on relevant positions with standard colours.

The position indicators shall give a true reflection of the position of the contacts and shall be visible to the operator. The operating direction of the handle shall be clearly indicated.

RMU shall incorporate electronic or mechanical pressure sensors to monitor the SF₆ gas pressure. When the SF₆ gas pressure falls below the pre-set value that should be indicated visually and control panel/RTU as required.

All manual operations to be carried out from the front of the RMU.

- i. Lockable facilities shall be provided for all interlock positions.
- ii. Operating handle shall be placed on the convenient position of the RMU.

Three phase current / voltage sensors should be available. Following safety features shall be incorporated to the Unit.

- Neon voltage indicators (live cable indication)
- Phase comparison facility

5.2.9. Bus Bars & Contacts

All Bus Bars & Contacts shall be of high quality copper as per the standards.



5.3. Basic Operational Aspects

5.3.1. Operational Interlocks

Interlocks on all switch positions shall be provided to prevent incorrect operations and unauthorized access. Integral cable testing facility shall be provided for Ring switches & unauthorized access to the ring cable test terminals shall be prevented by inter locking facility.

Safety of operation shall be ensured by interlocks which prevent;

- i. Inadvertent operation of any Ring switch & 'T' off CB switch direct from the 'ON' position to "Earth-On' position or vice versa.
- ii. Operation of Ring switch / Circuit Breaker cannot be performed when the earthing switch is in the 'ON' position
- iii. Operation of the earthing switch cannot be performed when the Ring switch / Circuit Breaker is in the 'ON' position
- iv. Opening & Closing of any access cover or doors of the switches /cable boxes shall be prevented unless the associated switch is at the "Earth-On" position.
- v. Test plugs or probes being inserted or withdrawn unless the relevant switch is at the 'Earth On' position.
- vi. Operation of any switch to 'ON' position from any position with the access cover opened.
- vii. Operation of any switch from 'Earth-On' to 'Off' position unless the associated access cover is closed and bolted or test plugs inserted.

5.3.2. Operator Safety

- i. In order to protect the operator at all times in switching functions, there will be no exposed front cable connections facing the operator. Connections at side and rear of the units are preferred.
- ii. Release of any accidental over-pressure inside the sealed container is to be limited by the opening of a pressure limiting device in the top of the enclosure or through other sides without directing to where operator standing.

5.3.3. Padlocking and interlocking devices

Arrangements shall be provided for locking up with padlocks of size 1" for each of the following:

- (i) Each of access doors and covers
- (ii) Operational positions

5.4. Cable Testing

The provision for Circuit cable testing shall be provided without disconnecting the cables to gain access to the connections for cable testing.



5.5. Earthing

- i. All panel and access covers or doors etc. rotating about hinges shall be earthed to the adjacent mainframes by copper flexible protective bonding conductors.
- ii. All the earthing terminals shall be inter-bonded for equal potential and brought to main earthing terminals.
- iii. The earthing conductor or strap mainly of copper shall be mechanically protected as well as against corrosion and be of adequate size for the coordinated rating as per schedule of particulars.

5.6. Remote Operation Facility (if requested in Price Schedule)

The RMU shall be provided with a RTU and the motorized operation for the remote operation including all the required accessories. In case of a failure in motorized mechanism, it shall be possible to operate the switches without a major modification.

The equipment shall be pre-wired for motor connection points, auxiliary switches for position indication of Ring switch, VCB, all earth switches, pressure transducer for low gas pressure alarm for

- Remote operation of Ring Switch of the RMU if specified in the price schedule
- Remote Operation & tripping of Circuit Breaker Switch if specified in the price schedule
- Low pressure indication

Remote Terminal Unit (RTUs) shall have following features;

- 3 phase monitoring of input voltage/current.
- 10 isolated digital inputs
- 8 digital control out puts
- Protocol IEC 60870-5-104, DNP 3.0 or latest version of them
- Shall be powered by external 24V DC power supply.
- Communication via GSM/GPRS/3G, PSTN, Radio link, Fiber Optic; the interface to the RTU shall be RS 232/ Ethernet/ USB.
- Local /Remote Operation
- The control software required at the CEB control station to operate the RMU shall also be separately provided with the offer.
- GSM/ GPRS/3G or better modem suitable to communicate with SCADA system using above protocols shall be provided with the offer.
- RTU should support following controls and indications through SCADA
 - Indications
 - Switch open
 - Switch closed
 - Earth selector earth/main
 - Fault passage indication - phase and/or earth fault
 - Local/remote mode
 - Mains/equipment failure
 - Battery low
 - Gas pressure low
 - Controls
 - Close/Open



- Protection Relay Reset
- Minimum 2 nos of spare digital output/ input shall be available in the RTU.
- Minimum 2 nos of spare analog output/ input shall be available in the RTU.
- All the indication and control signal wires should terminate through a terminal block located at the switchgear panel for easy maintenance and troubleshooting.

6.0 REQUIREMENTS FOR SELECTION

6.1. Quality Assurance

The manufacturer shall possess ISO 9001:2015 or latest Quality Assurance Certification valid throughout the delivery period of this bid, for the manufacture of SF6 insulated RMU/Switchgear for the plant where manufacturing is being done. The Bidder shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.

6.2. Manufacturing Experience

The manufacturer shall have minimum of fifteen (15) years experience in manufacturing SF6 Insulated RMU. Out of this period offered type of RMU should have been supplied successfully outside the country of the manufacturer for minimum of five (5) years for usage in utilities. The product offered has to be in same voltage range of offered item and shall have been used in service utilities over past 5 years.

If the manufacturer has supplied similar items to CEB for the last (5) years with proven sales records; without any adverse performance records, such manufacturers will be exempted from above requirements.

6.3. Type Tests

Following Type Test Certificates conforming to referred standards or any other international standard which is not less stringent, issued by:

Either

- (a) an accredited independent testing laboratory acceptable to the CEB or
- (b) an accredited or independent testing laboratory acceptable to the CEB where the type tests have been witnessed by CEB or a reputed independent body acceptable to CEB

shall be furnished with the offer. Type Test Certificates shall clearly indicate the relevant standard, items concerned, showing the manufacturers identity, type No. /catalogue No. and basic technical parameters. In case if the submitted type tests are according to any other international standard which is not less stringent than the specified, then the copy of the used standard in English shall be submitted with offer.

Proof of accreditation and accredited scope by a national/ international authority shall be forwarded with the offer. Test certificates shall be complete including all the pages as issued by the testing authority. Type test certificates shall be in English language. Parts of test certificates shall not be acceptable.



For circuit breaker and switches in enclosure

- (a) Dielectric tests
- (b) Temperature rise tests
- (c) Measurement of the resistance of the main circuit
- (d) Short-time and peak withstand current tests
- (e) Mechanical and environmental tests
- (f) Making and Breaking tests
- (g) Short-circuit tests
- (h) Verification of the degree of protection
- (i) Tightness tests
- (j) Electromagnetic compatibility (emc) tests.
- (k) Operation and Mechanical Endurance tests
- (l) Internal arc test certificate (for accessibility type B classification)

For protection relays

- | | |
|---|-----------------------------|
| i) DC Supply Interruption | - IEC 60255-11 |
| ii) AC Ripple on DC supply | - IEC 60255-11 |
| iii) Voltage Dips and Short Interruptions | - IEC 61000-4-11 |
| iv) High Frequency Disturbance | - IEC 60255-22-1, Class III |
| v) Fast Transient Disturbance | - IEC 60255-22-4, Cass IV |

7.0 INFORMATION TO BE FURNISHED WITH THE OFFER

The following shall be furnished with the offer.

(a) Following technical details in English clearly identifying the offered items, but not limited to:

- (i) Comprehensive catalogues,
- (ii) Dimensional drawings,
- (iii) Schematic diagrams,
- (iv) Calculations, graphs and tables
- (v) Operational literature,
- (vi) Name plate drawing to scale, incorporating the particulars called for
- (vii) Constructional & mounting details with electrical clearances
- (viii) A copy of the manual of the software.
- (ix) Materials used for components & relevant literature and electrical properties and mechanical properties



- (b) ISO 9001:2015 or latest Quality Assurance Certificate in accordance with clause 6.1.
- (c) Manufacturer shall furnish a list of supplies with supplied item, purchaser (specifying address contact persons and contact details, country), year & quantity to prove his manufacturing experience and outside the country sales in accordance with Clause 6.2.
- (d) Type Test Certificates in accordance with the clause 6.3.
- (e) Duly filled and signed 'Annex - B: Schedule of Technical Requirements and Guaranteed Technical Particulars'.
- (f) Other relevant Technical Details, protection operating curves and Calculations.
- (g) A set of spare parts manual and technical details of the equipment and components shall be

supplied with the equipment. These documents constitute a part from the equipment supplied and shall be listed with the equipment supplied to make sure that the documents are shipped along with the equipment.

- (h) Protocol guide lines should be provided for all available protocols
- (i) Evidence of operational endurance in service and design features to guarantee minimum maintenance performance shall be furnished with the offer.

Not furnishing above documents and details may result in offer being rejected.

8.0 PERFORMANCE GUARANTEES AND WARRANTY

Manufacturer shall provide 1 year warranty to CEB for the items and accessories from the date of delivery to CEB stores.

Manufacturer should provide CEB a performance guarantee with the letter of acceptance of the award ensuring service levels and technical performance given in his offer are met and maintained during the first year after the delivery to CEB stores.

9.0 SAMPLES

N/A.

10.0 SPARES

The Annex - A indicates the suggested spares for a 10 year trouble free service. That shall include the minimum percentage stipulated in Annex – A of quantity from each category and rating (rounding up to the highest integer). However, the Bidder shall indicate in the schedule of prices the type of spares and the quantities recommended by the manufacturer for the product they have offered. It is the bidder's responsibility to include all the spares for all ratings in this list. If any spare item is missed, at evaluation stage a cost will be assigned for missed item, based on the comparable item of bid or the similar cost of next highest offer. All the prices of spares shall be indicated and the total cost of spares will be taken for the evaluation.



11.0 PACKING AND LABELING/MARKING

11.1. Packing

The equipment shall be packed in a suitable manner for shipment to prevent damage during shipment and road transport up to Purchaser's warehouse.

11.2. Identification and Labeling/Marking

The name plate shall be marked/ labeled/engraved/embossed indelibly, legibly and in a weatherproof and abrasion proof manner as follows:

- (a) the word "CEB"
- (b) Ratings: voltage $U_0/U (U_m)$ / current / size / capacity
- (c) Standard adopted
- (d) Product type
- (e) year of manufacture, manufacturer's name or trade mark, warranty period

- (f) Rated current of bus bars of Ring switches & Circuit breaker
- (g) Rated filling pressure & temperature of gas for operation
- (h) Rated minimum pressure, short circuit ratings, temperature of gas for operation etc
- (i) Internal arc classification
- (j) Weight of complete equipment

12.0 INSPECTION AND TESTING

12.1. Routine Tests

Following Routine Test Certificates conforming to relevant standards shall be furnished for the observation of the Engineer appointed by CEB at the time of inspection. In addition, the routine test certificates shall be sent with the shipment.

- a) Power Frequency Voltage Tests
- b) Voltage Tests on Control and Auxiliary Circuits
- c) Measurement of Resistance of Main Circuit
- d) Tightness Tests
- e) Design and Visual Checks
- e) Mechanical Operation Tests



12.2. Inspection

The Successful bidder shall make necessary arrangements for inspection by an Engineer appointed by the CEB and also to carry out in his presence necessary Acceptance tests on procured item and material without any additional cost. Acceptance test reports shall be a part of the shipping document. CEB may waive off the inspection either with the condition of witnessing the acceptance tests by an independent body acceptable to CEB or completely. In such a situation a notice of waive off will be issued in advance to the supplier.

12.3. Acceptance Tests

Unless specified below, visual inspection, dimensional checks, sample tests specified in the relevant standards, selected type tests and the routine tests conducted for the selected sample in addition to the complete routine test reports shall form the acceptance test report.

- a) Dielectric withstand tests
- b) Mechanical Operation (including interlocks) checks
- c) Leakage test
- d) Power frequency voltage withstand tests
- e) Low and high temperature tests
- f) Verification of functions of the RTU if applicable

13.0 ANNEXES

- Annex – A : Schedule of Spares
- Annex – B : Schedule of Technical Requirements and Guaranteed Technical Particulars
- Annex – C : Non-Compliance Schedule

ANNEX- A

SCHEDULE OF SPARES
(To be filled and submit with the bid)

The approximate requirement of spares suggested by the purchaser is indicated below. The total price of the spares also shall be indicated in the schedule of prices.

	Quantity% (Specified by the Procurement Entity)	Unit FOB	Total FOB
Circuit breaker mechanism/ Actuator (single phase)	5%		
Vacuum interrupters complete with CB contacts if replaceable	5%		
Charging Circuit modules (Internal/External)	5%		
Current sensors of each rating (Single-phase units)	5%		
Voltage sensors (Single phase units)	5%		

Total FOB value

Total CIF value

Note

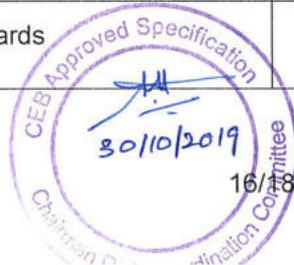
- 1: CEB reserves the right of ordering all the items or selected items depending on the requirement.
- 2: Above quantity shall be equal to the percentage of the ordering quantity, rounded up to the closest integer. The minimum quantity shall be considered as one.



ANNEX B

SCHEDULE OF TECHNICAL REQUIREMENTS AND GUARANTEED TECHNICAL PARTICULARS
(CEB Requirements shall be filled by the procurement entity and information of the offer shall be filled by the manufacturer)

	Description	CEB Requirement	Offered
1	Name & Country of the Manufacturer		
2	Model Number/type (Free Standing, Outdoor)		
3	Serial number & year of manufacture		
4	Rated Voltage	kV	
5	Frequency	Hz	50
6	Rated Lightning Impulse withstand voltage(peak)	kV	
7	Rated Normal Current		
	• Ring Switches	A	630
	• Tee-off Circuit Breaker	A	250
	• Busbar	A	630
8	Rated Short Circuit Making Current (Peak)		
	• Ring Switches	kA	50
	• Tee-off Circuit Breaker	kA	50
9	Rated Short Circuit Breaking Current(RMS)		
	• Circuit Breaker	kA	20
10	Rated Short Time Current & Duration		
	• Ring Switches	kA/3s	20
	• Tee-off Circuit Breaker	kA/3s	20
11	Earth Switch Making Current (Peak)		
	• Ring Switches	kA	50
12	Internal Arc Including Cable Boxes	kA/1s	20
13	Filling SF ₆ gas pressure	Bar (abs)	1.5
14	Minimum operating pressure of SF ₆ Gas	Bar (abs)	1
15	IP rating (Door Close)		IP54
16	Dimensions (HxWxD)	Mm	
17	Protection type for Circuit Breaker		TLF
18	Applicable Standards		As per Cl. 4.0



19	Operating handle		Yes	
20	Gas filling Nozzles as per International Std.		Yes	
21	Cable Boxes		Yes	
22	Pre-wired for Motor Operation facility		As specified	
23	Earth Fault Passage Indicator (EFI)		Left side	
24	Type & Sizes of Cable Terminations (Ex. 1C or 3C)			
25	Whether switches are independent manual operation with facility		Yes	
26	Whether Copies of Type test certificates & Quality Assurance ISO 9001:2015 furnished		Yes	
27	Whether Information requested as per clause 7.0 furnished		Yes	
27	Any deviations from the specification, if so furnish description		Indicate the relevant clause/s	
	Communication			
	RTU			

.....
Signature of the Manufacturer and seal

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date



Annex – C

Non-Compliance Schedule

On this schedule the bidder shall provide a list of non-compliances with this specification, documenting the effects that such non-compliance is likely to have on the equipment life and operating characteristics. Each non-compliance shall be referred to the relevant specification clause.

Clause No.	Non-Compliance

.....
Signature of the Manufacturer

.....
Date

I/We certify that the above data are true and correct

.....
Signature of the Bidder and seal

.....
Date

